

**MDA Horticulture Fund
Interim Report Year 3**

1. Project Title:

**Evaluation of disease and insect resistant elm hybrids and selections
for the Michigan climate**

2. Project MDAH #: 97513

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4. Reporting period: FY-07, June 2007-December 2007

5. Summary of goals and objectives:

The goals and objectives of this project are to continue the cultivation and evaluation of 16 or more hybrids and cultivars of *Ulmus* selected for disease and insect resistance. The America elms, European and Asian elm hybrids are to be evaluated for performance and growth characteristics under Michigan climatic conditions, including measurements of tree height, diameter at breast height, crown appearance, fall coloration and survival of disease and insect damages. :

6. Status of goals and objectives:

- A. In 2007, three additional cultivars, *U. americana* 'Louis & Clark-Prairie Expedition', *U. parvifolia* Emer I Allee 'Athena Classic' Lacebark Elm and *U. parvifolia* 'Ever Clear' Lacebark Elm (five replicates each) were randomly planted in the trial. A fourth cultivar *U. americana* 'Jefferson' was received in small pots and is being grown to larger size for 2008 planting. Two replacement trees of *U. americana* 'Valley Forge' and two *U. parvifolia* 'Emer II Allee' were planted. The 'Emer II Allee' are officially excluded from the National Elm Trial but two trees were added to the Michigan MSU planting. Weed barrier and bark mulch was applied around each tree. If the 'Jefferson' seedlings survive the winter they will join the trial planting in spring 2008.
- B. A website was established for the National Elm Trial which will be used by the MSU Trial <http://treehealth.agsci.colostate.edu/research/nationalelmtrial/NationalElmTrial.htm>
- C. A second website is established for the Dutch Elm Disease (DED) extension bulletin that discusses elm cultivars with DED resistance:
<http://www.extension.iastate.edu/Publications/SUL4.pdf>
- D. For the second season, Japanese beetle damage was heavy and leaves were collected to estimate susceptibility. We quantified the damage to samples of leaves taken from each tree and statistically compare the replicated cultivars to one another. A modification of the methods described by Dr. Doug Landis (O'Neal ME, Landis DA, Isaac R (2002) *An inexpensive, accurate method for measuring leaf area and defoliation through digital image analysis*. J. Econ. Entomol. 95(6): 1190-1194.) was employed. The original leaf area was measured using a flat bed scanner and Scion Image™ public domain software. And, the area of leaf tissue remaining after herbivory was measured using a LI-COR LI-3000 leaf area meter (LI-COR, Lincoln, NE). Percentage of leaf tissue remaining is then compared among cultivars in a Mean Separation test. This statistical comparison is in progress and results will be provided for the Final report in July 2008. Assessment of tree form and growth will be measured at bud break and recorded as 2007 growth. Data on tree assessments will be appended to the final report.

- E. Tree height, diameter at breast height, crown appearance, fall coloration and survival were recorded for 2007. Permanent and attractive tree labels were designed and produced for each cultivar in order to clearly display the trade name, and parentage of the original hybridization.

Outreach activities related to project:

In Spring 2007 and again in 2008, 50 MSU undergraduate and graduate students will be driven to the Elm trial location and received a detailed discussion of the trial's purpose, the history of the cultivars, and the current results of performance evaluations. The graduate students in the course Plant Pathology 885, Plant Diseases in the Field, were taken to the trial planting and it was discussed. Extension bulletins on Dutch Elm Disease that feature photographs and descriptions of DED resistant elm cultivars were distributed to the MSU students majoring in horticulture and forestry during the PLP/ENT 407 DISEASES AND INSECTS OF FOREST AND SHADE TREES course in May 2007.

Table of Cultivars planted in Michigan ['Jefferson' planned for 2008]

	<i>Ulmus</i> Species	Cultivar	Source
1	<i>U. propinqua</i> (JFS Bierberich)	'Emerald Sunshine'	J. Frank Schmidt & Son
2a	<i>U. parvifolia</i>	Emer II Allee	The Botany Shop
2b	<i>U. americana</i>	'Princeton'	Princeton Nurseries
3	<i>U. carpinifolia</i> X <i>U. parvifolia</i>	'Frontier'	J. Frank Schmidt & Son
4	<i>U. glabra</i> X <i>U. carpinifolia</i> X <i>U. pumila</i>	'Homestead'	J. Frank Schmidt & Son
5	<i>U. pumila</i> X <i>U. japonica</i> X <i>U. wilsoniana</i> Mortality is high	'Morton Glossy Triumph'	J. Frank Schmidt & Son
6	<i>U. pumila</i> X <i>U. japonica</i>	'Morton Plainsman Vanguard'	J. Frank Schmidt & Son
7	<i>U. japonica</i> X <i>U. wilsoniana</i>	'Morton Red Tip Danada Charm'	J. Frank Schmidt & Son
8	<i>U. carpinifolia</i> X <i>U. pumila</i> X <i>U. wilsoniana</i>	'Morton Stalwart Commendation'	J. Frank Schmidt & Son
9	<i>U. japonica</i> X <i>U. wilsoniana</i>	'Morton Accolade'	J. Frank Schmidt & Son
10	<i>U. pumila</i> X <i>U. japonica</i>	'New Horizon'	J. Frank Schmidt & Son
11	(<i>U. glabra</i> X <i>U. carpinifolia</i> X <i>U. pumila</i>) X <i>U. wilsoniana</i>	'Patriot'	J. Frank Schmidt & Son
12	<i>U. glabra</i> X <i>U. carpinifolia</i>	'Pioneer'	J. Frank Schmidt & Son
13	<i>U. wilsoniana</i>	'Prospector'	J. Frank Schmidt & Son
14	<i>U. americana</i>	'Valley Forge'	J. Frank Schmidt & Son
15	<i>U. americana</i>	New Harmony' Planted in 2006	Princeton Nurseries
16	<i>U. americana</i> planned for Spring 2008	'Jefferson'	The Botany Shop & Phytotektor
17	<i>U. americana</i>	'Prairie Expedition'	Lee Nursery, Inc.
18	<i>U. parvifolia</i>	Emer I 'Athena Classic' Lacebark	Angel Creek Nursery, Inc.
19	<i>U. parvifolia</i>	'Everclear' Lacebark	Angel Creek Nursery, Inc.

Photographs of the Michigan State University Elm Trial July 2007

